



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/654,203

09/03/2003

James A. Rakowski

RL-2000

5809

7590 02/26/2007  
Patrick J. Viccaro, Esquire  
Allegheny Technologies Incorporated  
1000 Six PPG Place  
Pittsburgh, PA 15222-5479

EXAMINER

ROE, JESSEE RANDALL

ART UNIT

PAPER NUMBER

1742

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
--	-----------	---------------

3 MONTHS

02/26/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/654,203

Applicant(s)

RAKOWSKI, JAMES A.

Examiner

Jessee Roe

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-98 is/are pending in the application.
- 4a) Of the above claim(s) 6, 8, 14, 23, 24 and 27-98 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 9-13, 15-22, 25 and 26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claims Status***

Claims 1-5, 7, 9-13, 16-22, 25 and 26 remain for examination wherein claims 1, 10 and 11 are amended; claim 15 is canceled; and claims 6, 8, 14, 23, 24 and 27-98 are withdrawn from consideration.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grubb (US 6,641,780).

In regards to claim 1-5 and 9-10, Grubb ('780) discloses a method of making an uncoated ferritic stainless steel article that would have an oxidation resistant surface. The method of Grubb ('780) comprises providing a ferritic stainless steel that would have less than about 0.25 weight percent aluminum (col. 8, lines 44-50) (which overlaps the at least 0.2 weight percent aluminum of the instant invention); up to 0.1 weight percent cerium (col. 7, lines 45-64) (which overlaps the greater than 0.02 weight percent rare earth metal of the instant invention); and greater than 25 weight percent chromium (col. 5, lines 16-30) (which overlaps 16 to less than 30 weight percent chromium of the instant invention). The Examiner notes that the composition disclosed by Grubb ('780)

Art Unit: 1742

overlaps the composition of the instant invention, thereby establishing a prima facie case of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed compositions from the compositions of Grubb ('780) because Grubb ('780) discloses the same utility (SOFC interconnects) throughout the disclosed ranges.

Still regarding claim 1, Grubb ('780) also discloses polishing (surface modification) strips of the ferritic stainless steel article for metallographic examination (col. 10, lines 43-57) and high temperature oxidation testing for 500 hours at 800°C (col. 18, line 55 - col. 20, line 9). Grubb ('780) does not specify the hematite structure that would be formed. However, it would be expected that with the same composition and a substantially similar process, the hematite structure and the hematite lattice parameters formed by Grubb ('780) would be the same as that of the instant invention. See MPEP 2112.01 I.

Claims 7, 11-13, 16-19, 21 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grubb (US 6,641,780) in view of Gamble (US 2,692,853).

In regards to claims 7 and 11-12, Grubb ('780) discloses polishing strips of ferritic stainless steel as shown above, but Grubb ('780) does not specify wherein the strips would be electrochemically polished.

Gamble ('853) discloses method of electrochemically polishing ferritic stainless steel to achieve a bright mirror-like polished surface (Examples 1-3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of making a ferritic stainless steel

Art Unit: 1742

article, as disclosed by Grubb ('780), by electropolishing a ferritic stainless steel article, as disclosed by Gamble ('853), in order to obtain a bright mirror-like polished surface, as disclosed by Gamble ('853) (Examples 1-3).

In regards to claims 13, 16-19 and 25, Grubb ('780) discloses a method of making a ferritic stainless steel article that would have an oxidation resistant surface. The method of Grubb ('780) comprises providing a ferritic stainless steel that would have less than about 0.25 weight percent aluminum (col. 8, lines 44-50) (which overlaps the at least 0.2 weight percent aluminum of the instant invention) ; up to 0.1 weight percent cerium (col. 7, lines 45-64) (which overlaps the greater than 0.02 weight percent rare earth metal of the instant invention); and greater than 25 weight percent chromium (col. 5, lines 16-30) (which overlaps 16 to less than 30 weight percent chromium of the instant invention). The Examiner notes that the composition disclosed by Grubb ('780) overlaps the composition of the instant invention, thereby establishing a prima facie case of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed compositions from the compositions of Grubb ('780) because Grubb ('780) discloses the same utility (solid oxide fuel cell interconnects) throughout the disclosed ranges.

Still regarding claim 13, Grubb ('780) also discloses polishing (surface modification) strips of the ferritic stainless steel article for metallographic examination (col. 10, lines 43-57) and high temperature oxidation testing for 500 hours at 800°C (col. 18, line 55 - col. 20, line 9). Grubb ('780) does not specify the hematite structure that would be formed. However, it would be expected that with the same composition and a

Art Unit: 1742

process substantially the same as the instant invention, the hematite structure and the hematite lattice parameters formed by Grubb ('780) would be the same as that of the instant invention. See MPEP 2112.01 I.

Still regarding claim 13, Grubb ('780) discloses polishing strips of ferritic stainless steel as shown above, but Grubb ('780) does not specify wherein the strips would be electrochemically polished.

Gamble ('853) discloses a method of electrochemically polishing ferritic stainless steel in an electrolyte to achieve a bright mirror-like polished surface (Examples 1-3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of making a ferritic stainless steel article, as disclosed by Grubb ('780), by electropolishing a ferritic stainless steel article, as disclosed by Gamble ('853), in order to obtain a bright mirror-like polished surface, as disclosed by Gamble ('853) (Examples 1-3).

Still regarding claim 25, the electropolishing of Gamble ('853) would require a cathode and passing a current between the ferritic stainless steel article and the cathode would remove material from the surface, thereby reducing the surface roughness of the surface.

In regards to claim 21, Grubb ('780) discloses that silicon would preferably be less than about 0.5 weight percent (col. 8, lines 33-43).

In regards to claim 26, the electropolishing of Gamble ('853) would improve the resistance of the surface to oxidation when subjected to a temperature and an atmosphere characteristic of operating conditions with a solid oxide fuel cell because

Art Unit: 1742

Grubb ('780) in view of Gamble ('853) discloses substantially the same composition and same processing as that of the instant invention.

Claims 11-12, 14 and 16-22 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takehiro (JP 10-280103) in view of Gamble (US 2,692,853)

In regards to claims 11-12, 14, 16 and 25, Takehiro (JP '103) discloses a method of making an uncoated ferritic stainless steel article that would have an oxidation resistant surface. The method of Takehiro (JP '103) comprises providing a ferritic stainless steel that would have less than or equal to 1 weight percent aluminum (which overlaps the at least 0.2 weight percent aluminum of the instant invention), 15 to 30 weight percent chromium (which overlaps 16 to less than 30 weight percent chromium of the instant invention), and less than or equal to 0.5 weight percent yttrium (which overlaps the greater than 0.02 weight percent rare earth metal of the instant invention) (abstract) [0009-0010]. The Examiner notes that the composition disclosed by Takehiro (JP '103) overlaps the composition of the instant invention, thereby establishing a prima facie case of obviousness. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed compositions from the compositions of Takehiro (JP '103) because Takehiro (JP '103) discloses the same utility (fuel cell components) throughout the disclosed ranges.

Still regarding claims 11-12, Takehiro (JP '103) further discloses generating an oxide layer by heat-treating for 100 hours at 1000°C and forming exfoliations of the oxidation scale [0024]. However, Takehiro (JP '103) do not specify electrochemically modifying the surface to remove the scale.

Gamble ('853) discloses a method of electrochemically polishing ferritic stainless steel in an electrolyte to achieve a bright mirror-like polished surface (Examples 1-3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of making a ferritic stainless steel article, as disclosed by Takehiro (JP '103), by electropolishing a ferritic stainless steel article, as disclosed by Gamble ('853), in order to obtain a bright mirror-like polished surface, as disclosed by Gamble ('853) (Examples 1-3).

Still regarding claim 25, the electropolishing of Gamble ('853) would require a cathode and passing a current between the ferritic stainless steel article and the cathode would remove material from the surface, thereby reducing the surface roughness of the surface.

In regards to claims 17-19, Takehiro (JP '103) discloses that the ferritic stainless would have less than or equal to 0.5 weight percent yttrium (which overlaps the greater than 0.02 up to 1.0 weight percent rare earth metal limitation) (abstract).

In regards to claim 20-21, Takehiro (JP '103) discloses that the ferritic stainless would have 15 to 30 weight percent chromium (which overlaps the 18 up to 22 weight percent chromium of the instant invention), less than or equal to 1 weight percent aluminum (which overlaps 0.4 to 0.8 weight percent aluminum of the instant invention), less than or equal to 0.5 weight percent yttrium (which overlaps the 0.02 to 0.2 weight percent rare earth metal of the instant invention), and less than or equal to 1 weight percent titanium (which overlaps the up to 0.5 weight percent titanium) (abstract).

In regards to claim 22, Takehiro (JP '103) discloses that the ferritic stainless



Art Unit: 1742

would have 15 to 30 weight percent chromium (which overlaps the about 22 weight percent chromium of the instant invention), less than or equal to 1 weight percent aluminum (which overlaps the about 0.6 weight percent aluminum of the instant invention), less than or equal to 0.2 weight percent rare earth elements, which includes cerium and lanthanum (which overlaps the up to 0.10 weight percent cerium and lanthanum composition of the instant invention), and less than or equal to 1 weight percent titanium (which overlaps the up to 0.5 weight percent titanium) (abstract).

In regards to claim 24, Takehiro (JP '103) discloses that the ferritic stainless would have 15 to 30 weight percent chromium (which overlaps the 16 to less than 30 weight percent chromium of the instant invention), less than or equal to 1 weight percent aluminum (which overlaps the at least 0.2 weight percent aluminum of the instant invention), less than or equal to 0.2 weight percent rare earth elements (which overlaps the 0.02 up to 1.0 weight percent rare earth metals) (abstract).

In regards to claim 26, the electropolishing of Gamble ('853) would improve the resistance of the surface to oxidation when subjected to a temperature and an atmosphere characteristic of operating conditions with a solid oxide fuel cell because Grubb ('780) in view of Gamble ('853) discloses substantially the same composition and same processing as that of the instant invention.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-5, 7, 9-13, 16-22, 25 and 26 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

An English translation of Takehiro (JP 10-280103) was requested on 15 February 2007 and will be forwarded to the Applicant upon receipt.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571) 272-5938. The examiner can normally be reached on Monday-Friday 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1742

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JR

NOTED  
SUPERVISOR  
TECHNICAL